Code: 17T00106A

Pharm.D I Year Advanced Supplementary Examinations February/March 2023

REMEDIAL MATHEMATICS

(For 2017, 2018, 2019, 2020 & 2021 admitted batches only)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

(a) Find the determinant of a matrix $A = \begin{bmatrix} 2 & 3 & 1 \\ 6 & 5 & 2 \\ 1 & 4 & 7 \end{bmatrix}$ 2M

(b) What is the use of Cramer's rule? 2M

(c) Find the equation of the line passing through the point (1, 1) and perpendicular to the line passing through the points (3, 5) and (-6, -2). 2M

(d) If a = 18, b = 24 and c = 30 then find sin A, sin B and sin C. 2M

(e) Solve the following system of equations by Cramer's rule $x - y + 2z = 7$, $3x + 4y - 5z = -5$, $2x - y + 3z = 12$. 2M

(f) Integrate $\int \sin^4 x\,dx$. 2M

(g) Solve $\frac{dy}{dx} = xy - y$. 2M

(h) Solve: 2M

$$\frac{dy}{dx} = \frac{x+y}{x}$$

(i) Find the Laplace transform of the function $Cos2t$. 2M

(j) Find the Laplace Transform of $e^{-t}\sin t$. 2M

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

2 (a) Find the determinant of the matrix A where 5M

$$A = \begin{bmatrix} 1 & 3 & 2 \\ -3 & -1 & -3 \\ 2 & 3 & 1 \end{bmatrix}.$$

(b) If $A = \begin{bmatrix} 3 & 1 & 2 \\ 1 & 0 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & -1 \\ 2 & 1 \\ 3 & 1 \end{bmatrix}$, find AB 5M

OR

3 (a) Evaluate $\lim_{x \to 2} \frac{\frac{1}{x} - \frac{1}{2}}{x - 2}$. 5M

(b) If sinA = 3/5, cosB = 9/41 then find the value of sin(A-B) and sin(A+B). 5M

Contd. in page 2

4 (a) If $y = a\cos(\log x) + b\sin(\log x)$ *show that* $x^2 y_{n+2} + (2n+1)xy_{n+1} + (n^2+1)y_n = 0$. 5M

(b) Find the n^{th} derivative of $\cos x \cos 2x \cos 3x$. 5M

OR

5 (a) If $z = f(x+ct) + \phi(x-ct)$, *prove that* $\frac{\partial^2 z}{\partial t^2} = c^2 \frac{\partial^2 z}{\partial x^2}$. 5M

(b) State and Prove Euler's theorem on Homogeneous function. 5M

6 (a) Find the value of $\int \frac{dx}{x(x-1)}$ 5M

(b) Find the value of $\int \sin^2 x\, dx$. 5M

OR

7 (a) Solve $\frac{dy}{dx} = xy - y$. 5M

(b) Solve $y'' - 3y' + 2y = xe^{3x}$. 5M

8 (a) Solve $\frac{dy}{dx} = 3x^2(y+2)$. 5M

(b) Solve $\frac{dy}{dx} = \frac{2y}{x(y-1)}$. 5M

OR

9 (a) Define: (i) Differential equation (ii) Order of a differential equation (iii) Degree of a differential equation (iv) Linear differential equation with an example. 5M

(b) Solve the differential equation $\frac{dy}{dx} + 2xy = e^{-x^2}$ 5M

10 (a) $e^{3t}\cos 5t + t\sin t + \frac{\cos t}{t}$ *Find* $L[f(t)]$. 5M

(b) Find $L(5\sin t + 2\sin 3t)$ 5M

OR

11 (a) Find $L\{e^{-t}\sin 6t + t\cos 3t\}$. 5M

(b) Find $L[e^{-t} Sin^2 t]$ 5M

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Code: 17T00106A

Pharm.D I Year Advanced Supplementary Examinations April 2022

REMEDIAL MATHEMATICS

(For 2017, 2018, 2019 & 2020 admitted batches only)

Time: 3 hours | Max. Marks: 70

PART – A

(Compulsory Question)

*****

1 Answer the following: (10 X 02 = 20 Marks)

(a) Find the inverse of the matrix $\begin{bmatrix} 2 & 3 & 4 \\ 4 & 3 & 1 \\ 1 & 2 & 4 \end{bmatrix}$.

(b) If tan (cot x) = cot (tan x), then sin 2x.

(c) Suppose H(t) = t^2 + 5t + 3. Find the $\lim_{t \to 2} H(t)$.

(d) If $y = e^{ax} \cos bx$, prove that $y_2 + 2ay_1 + (a^2 + b^2)y = 0$.

(e) Evaluate $\int_0^{\pi/2}$ [illegible] $x\,dx$

(f) Evaluate $\int_0^{\pi/6} \sin^3 3\theta \, d\theta$.

(g) Solve $(x+1)\frac{dy}{dx} + 1 = 2e^{-y}$.

(h) Solve $\frac{dy}{dx} = \cos(x + y + 1)$.

(i) Find the Laplace transform of $\sin 2t \sin 3t$.

(j) Find the Laplace transform of $\cos^2 2t$.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

2 (a) Reduce the matrix $\begin{bmatrix} -19 & 7 \\ -42 & 16 \end{bmatrix}$ to the diagonal form.

(b) IF A = $\begin{bmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{bmatrix}$ Calculate A^4.

OR

3 (a) Reduce the matrix $\begin{bmatrix} -1 & 1 & -2 \\ 1 & 2 & 1 \\ -1 & -1 & 0 \end{bmatrix}$ to the diagonal form.

(b) Find the inverse of $\begin{bmatrix} 1 & 1 & 3 \\ 1 & 3 & -3 \\ -2 & -4 & -4 \end{bmatrix}$.

Contd. in page 2

4 (a) Find the nth derivative of $e^{x}(2x+3)^{3}$.

(b) If $y = a\cos(\log x) + b\sin(\log x)$ *show that* $x^2 y_{n+2} + (2n+1)xy_{n+1} + (n^2+1)y_n = 0$.

OR

5 (a) Find the n[th] derivative of $\log(4x^2-1)$.

(b) If $y = \tan^{-1} x$ *prove that* $(1+x^2)y_{n+2} + 2(n+1)xy_{n+1} + n(n+1)y_n = 0$.

6 (a) Evaluate $\int_0^{\pi} \sin^5(x/2)\, dx$.

(b) Evaluate $\int_0^{\pi} \sin^6 x \cos^4 x\, dx$.

OR

7 (a) Evaluate $\int^{\pi} \frac{\sin^4\theta}{(1+\cos\theta)^2}\, dx$

(b) Evaluate $\int^{2} \frac{x^4}{\sqrt{4-x^2}}\, dx$.

8 (a) Solve $y'' + 4y' + 4y = 3\sin x$.

(b) Solve $(D-2)^2 = 8(\sin 2x + x^2)$.

OR

9 (a) Solve $y'' - 2y' + y = xe^{x}\cos x$.

(b) Solve $y'' - y = x\sin 3x$.

10 (a) Find the Laplace transform of $e^{2t}\cos^2 2t$.

(b) Find the Laplace transform of $\sqrt{t}e^{3t}$.

OR

11 (a) Find the Laplace transform of $3\sqrt{t} + \frac{4}{\sqrt{t}}$.

(b) Find the Laplace transform of $\left(\sqrt{t} - \frac{1}{\sqrt{t}}\right)^3$.

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Code: 17T00106A

Pharm.D I Year Supplementary Examinations July/August 2021

REMEDIAL MATHEMATICS

(For 2017, 2018 & 2019 admitted batches only)

Time: 3 hours | Max. Marks: 70

PART – A

(Compulsory Question)

*****

1 Answer the following: (10 X 02 = 20 Marks)

(a) Determine the rank of the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 1 & 4 & 2 \\ 2 & 6 & 5 \end{bmatrix}$.

(b) If the sides of a triangle are 13,14,15, then find $\frac{Sin\,A}{Sin\,B}$.

(c) If $y = ae^{nx} + be^{-nx}$, then prove that $y'' = n^2 y$.

(d) If $z = f(x+ct) + \phi(x-ct)$, then prove that $\frac{\partial^2 z}{\partial t^2} = c^2 \frac{\partial^2 z}{\partial x^2}$.

(e) Evaluate the integral $\int_0^4 \frac{x^2}{1+x} dx$.

(f) Evaluate $\int_0^{16} \frac{x^{1/4}}{1+x^{1/2}} dx$.

(g) Find the order and degree of $\left[\frac{d^2y}{dx^2} + \left(\frac{dy}{dx}\right)^3\right]^{6/5} = 6y$.

(h) Solve the differential equation $\frac{dy}{dx} + y\tan x = \cos^3 x$.

(i) Find the equation of the circle for which the points (1, 2) and (4, 6) are the end points of a diameter.

(j) Define Laplace transform.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

2 (a) Find the matrix A such that $\begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix} A \begin{bmatrix} -3 & 2 \\ 5 & -3 \end{bmatrix} = \begin{bmatrix} -2 & 4 \\ 3 & -1 \end{bmatrix}$.

(b) (i) If $a = (b-c)\sec\theta$, prove that $\tan\theta = \frac{2\sqrt{bc}}{b-c}\sin\frac{A}{2}$.

(ii) If a = 4, b = 5, c = 7, find $\cos\frac{B}{2}$.

OR

3 (a) Investigate the values of λ and μ so that the equations $2x+3y+5z=9$, $7x+3y-2z=8$, $2x+3y+\lambda z=\mu$, have: (i) No solution. (ii) A unique solution. (iii) An infinite number of solutions.

(b) In a Δ ABC show that $\frac{b^2-c^2}{a^2} = \frac{\sin(B-C)}{\sin(B+C)}$.

Contd. in page 2

4 (a) Check the continuity of the function given by $f(x)=\begin{cases} 4-x^2 & if \quad x\le 0 \\ x-5 & if \quad 0<x\le 1 \\ 4x^2-9 & if \quad 1<x<2 \\ 3x+4 & if \quad x\ge 2 \end{cases}$ at the points 0, 1 and 2.

(b) If $y=ae^{-bx}\cos(cx+d)$ then, prove that $y''+2by'+(b^2+c^2)y=0$.

OR

5 (a) Show that $x\frac{\partial u}{\partial x}+y\frac{\partial u}{\partial y}=2u\log u$ where $\log u=\frac{(x^3+y^3)}{(3x+4y)}$.

(b) If $y=(\sin^{-1}x)^2$, show that $(1-x^2)y_{n+2}-(2n+1)xy_{n+1}-n^2y_n=0$ hence find $(y_n)_0$ by using Leibnitz theorem.

6 (a) (i) Evaluate $\int_1^4 x\sqrt{x^2-1}\,dx$.

(ii) Evaluate $\int_0^4 |2-x|\,dx$.

(b) Evaluate $\lim_{n\to\infty}\left[\left(1+\frac{1}{n}\right)\left(1+\frac{2}{n}\right)\ldots\ldots\left(1+\frac{n}{n}\right)\right]^{1/n}$ by using definite integral as the limit of a sum.

OR

7 (a) Evaluate $\int_0^1 xTan^{-1}x\,dx$.

(b) Evaluate $\int_0^{\pi}\frac{x\sin x}{1+\cos^2 x}dx$.

8 (a) Solve $\frac{dy}{dx}=\frac{x^2+y^2}{2x^2}$.

(b) Solve $\frac{d^2y}{dx^2}+\frac{dy}{dx}+y=(1-e^x)^2$.

OR

9 (a) Solve the differential equation $\sin^2 x\frac{dy}{dx}+y=\cot x$.

(b) Solve $y''+4y'+4y=3\sin x+4\cos x$.

10 (a) Find the equation of the tangents to the circle $x^2+y^2+2x-2y-3=0$ which are perpendicular to $3x-y+4=0$.

(b) Find Laplace transform of $\sin 2t\sin 3t$.

OR

11 (a) Find the foot of perpendicular drawn from (3, 0) upon the straight line $5x+12y-41=0$.

(b) Find Laplace transform of $e^{-3t}(2\cos 5t-3\sin 5t)$.

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Code: 17T00106A

Pharm.D I Year Regular & Supplementary Examinations December 2021

REMEDIAL MATHEMATICS

(For 2017, 2018, 2019 & 2020 admitted batches only)

Time: 3 hours | Max. Marks: 70

PART – A

(Compulsory Question)

*****

1 Answer the following: (10 X 02 = 20 Marks)

(a) Find the inverse of the matrix $\begin{bmatrix} 2 & 3 & 4 \\ 4 & 3 & 1 \\ 1 & 2 & 4 \end{bmatrix}$.

(b) If tan (cot x) = cot (tan x), then sin 2x.

(c) Suppose H(t) = t^2 + 5t + 1. Find the limit lim t→2 H(t).

(d) If $y = e^{ax}\sin bx$, prove that $y_2 - 2ay_1 + \left(a^2 + b^2\right)y = 0$.

(e) Evaluate $\int_0^{\pi/2} \cos^9 x\,dx$.

(f) Evaluate $\int_0^{\pi/6} \sin^5 3\theta\,d\theta$.

(g) Solve $\left(x^2 - y^2\right)dx = 2xdy$.

(h) Solve $x^2 ydx - \left(x^3 + y^3\right)dy = 0$.

(i) Find the Laplace transform of $\cos 2t \cos 3t$.

(j) Find the Laplace transform of $\sin^3 2t$.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

2 (a) Express each of the following matrices as the sum of a symmetric and a skew symmetric matrix:

$$\begin{bmatrix} 3 & -2 & 6 \\ 2 & 7 & -1 \\ 5 & 4 & 0 \end{bmatrix}$$

(b) Find the inverse of $\begin{bmatrix} 2 & 3 & 4 \\ 4 & 3 & 1 \\ 1 & 2 & 4 \end{bmatrix}$.

OR

3 (a) A = $\begin{bmatrix} 1 & 1 & 2 \\ 1 & 9 & 3 \\ 1 & 4 & 2 \end{bmatrix}$ B = $\begin{bmatrix} 1 & 2 & 0 \\ 2 & 3 & -1 \\ 1 & -1 & 3 \end{bmatrix}$ verify that $(AB)^{-1} = B^{-1}A^{-1}$.

(b) Prove that $A^3 - 4A^2 - 3A + 11I = 0$ where $A = \begin{bmatrix} 1 & 3 & 2 \\ 2 & 0 & -1 \\ 1 & 2 & 3 \end{bmatrix}$.

Contd. in page 2

4 (a) Find the n[th] derivative of $\frac{x}{1+3x+2x^2}$.

(b) If $y = e^{m\cos^{-1}x}$ prove that $\left(1-x^2\right)y_{n+2}-\left(2n+1\right)xy_{n+1}-\left(n^2+m^2\right)y_n = 0$.

OR

5 (a) Find the n[th] derivative of $x^5 + \log_{10}\left(3x^2+5x-2\right)$.

(b) If $y = x^2e^x$ prove that $y_n = \frac{1}{2}n(n-1)y_2 - n(n-2)y_1 + \frac{1}{2}(n-1)(n-2)y$.

6 (a) Evaluate $\int_0^{\pi/6}\cos^4 3\theta\sin^3 6\theta\ d\theta$ using reduction formula.

(b) Evaluate $\int_0^1 x^{3/2}\left(1-x\right)^{3/2}\ dx.$

OR

7 (a) Evaluate $\int_0^{\pi/2}\sin^8 x\cos^6 x\,dx$.

(b) Evaluate $\int_0^{\pi} x\sin^2 x\cos^4 x\,dx$.

8 (a) Solve $y''-4y'+4y = 3\cos x$.

(b) Solve $(D-4)^2 = 8\left(\cos 2x + x^2\right)$

OR

9 (a) Solve $y''-2y'+2y = x + e^x\cos x$.

(b) Solve $y''-y = x\cos 3x$.

10 (a) Find the Laplace transform of $t\ \sin at$.

(b) Find the Laplace transform of $e^{-t}\sin^2 t$.

OR

11 (a) Find the Laplace transform of $\cos t\ \cos 2t\ \cos 3t$.

(b) Find the Laplace transform of $\sin^2\left(2t+1\right)$.

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Code: 17T00106A

Pharm.D I Year Regular & Supplementary Examinations December 2020

REMEDIAL MATHEMATICS

(For 2017, 2018 & 2019 admitted batches only)

Time: 3 hours | Max. Marks: 70

PART – A

(Compulsory Question)

*****

1 Answer the following: (10 X 02 = 20 Marks)

(a) Find the inverse of $\begin{bmatrix} 1 & 1 & 3 \\ 1 & 3 & -3 \\ -2 & -4 & -4 \end{bmatrix}$.

(b) If $\tan\frac{A}{2} = \frac{5}{6}$ and $\tan\frac{C}{2} = \frac{2}{5}$, determine the relation between a, b, c.

(c) Compute the limit $\lim_{x \to \frac{\pi}{2}} \frac{\cos x}{\left(x - \frac{\pi}{2}\right)}$.

(d) If $z = x^3 + y^3 - 3axy$ then show that $\frac{\partial^2 z}{\partial y \partial x} = \frac{\partial^2 z}{\partial x \partial y}$.

(e) Evaluate the integral $\int_0^{\pi/2} \frac{\sin^5 x}{\sin^5 x + \cos^5 x} dx$.

(f) Evaluate $\int_{-\pi/2}^{\pi/2} \sin|x| \, dx$.

(g) Find the general solution of $x + y\frac{dy}{dx} = 0$.

(h) Solve $\frac{d^2x}{dt^2} + 6\frac{dx}{dt} + 9x = 0$.

(i) Find the vertex and focus of $4y^2 + 12x - 20y + 67 = 0$.

(j) State first shifting property.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

2 (a) Prove that the matrix $A = \begin{bmatrix} \frac{1}{2}(1+i) & \frac{1}{2}(-1+i) \\ \frac{1}{2}(1+i) & \frac{1}{2}(1-i) \end{bmatrix}$ is unitary and find A^{-1}.

(b) In ΔABC, if $\frac{1}{a+c} + \frac{1}{b+c} = \frac{3}{a+b+c}$, show that $C = 60^0$.

OR

3 (a) Solve the following system of equations by matrix method $2x - y + 3z = 8$, $x - 2y - z = -4$, $3x + y - 4z = 0$.

(b) If the angles of ΔABC are in the A.P and $b : c = \sqrt{3} : \sqrt{2}$, then show that $A = 75^0$.

Contd. in page 2

4 (a) Verify whether the following function is differentiable at 1 and 3.

$$f(x)=\begin{cases} x & if \quad x<1 \\ 3-x & if \quad 1\le x\le 3 \\ x^2-4x+3 & if \quad x>3 \end{cases}$$

(b) If $ax^2+2hxy+by^2=1$, then prove $\frac{d^2y}{dx^2}=\frac{h^2-ab}{(hx+by)^3}$.

OR

5 (a) If $u=\sin^{-1}\frac{x+2y+3z}{x^8+y^8+z^8}$, find the value of $x\frac{\partial u}{\partial x}+y\frac{\partial u}{\partial y}+z\frac{\partial u}{\partial z}$.

(b) Find the n^{th} derivative of $e^x(2x+3)^3$ by using Leibnitz theorem.

6 (a) Evaluate $\lim_{n\to\infty}\frac{2^k+4^k+6^k+---+(2n)^k}{n^{k+1}}$ by using definite integral as the limit of a sum.

(b) Evaluate $\int_0^{\pi/4}\log(1+\tan x)\,dx$.

OR

7 (a) Evaluate $\int_0^{\pi}\frac{x\sin^3 x}{1+\cos^2 x}\,dx$.

(b) Evaluate $\int_0^1\frac{\log(1+x)}{1+x^2}\,dx$.

8 (a) Solve the differential equation $\frac{dy}{dx}=\frac{3y-7x+7}{3x-7y-3}$.

(b) Solve $(D-2)^2y=8(e^{2x}+\sin 2x+x^2)$.

OR

9 (a) Solve $\frac{dy}{dx}+\frac{y^2+y+1}{x^2+x+1}=0$.

(b) Solve $y''-2y'+2y=x+e^x\cos x$.

10 (a) Show that the lines $2x+y-3=0$, $3x+2y-2=0$ and $2x-3y-23=0$ are concurrent and find the point of concurrency.

(b) Find the Laplace transform of $e^{2t}+4t^3-2\sin 3t+3\cos 3t$.

OR

11 (a) Find the coordinates of the vertex, focus, equation of directrix and axis of the following parabola $3x^2-9x+5y-2=0$.

(b) Find the Laplace transform of $e^{2t}\cos^2 t$.

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Code: 17T00106A

Pharm.D I Year Supplementary Examinations February 2020

REMEDIAL MATHEMATICS

(For 2017 & 2018 admitted batches only)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

*****

1 Answer the following: (10 X 02 = 20 Marks)

(a) Find the inverse of the matrix $A = \begin{bmatrix} 1 & 2 \\ 5 & 7 \end{bmatrix}$.

(b) If $\tan A = 3/5$, find the values of $\sin 2A \;\; \cos 2A$.

(c) State Leibnitz's theorem.

(d) Form the differential equation $y = ae^x + b$, where a, b are parameters.

(e) Evaluate $\int x\, e^{2x} dx$.

(f) Find $\frac{d}{dx}(5x^2 + 6\sin x)$.

(g) Find the value of $\lim_{x\to 0} \frac{\sin bx}{x\, cosx}$.

(h) Integrate $\int_0^{2\pi} sin^2 x\, dx$.

(i) Find the distance between the two parallel lines $3x + 4y + 3 = 0, 3x + 4y + 7 = 0$.

(j) Find the value of $L\{cos^2 2t\}$.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

2 (a) If $A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$ then show that $\mathrm{A(A-3I)(A-15I) = 0}$.

(b) In a triangle ABC, prove that $cos^2\frac{A}{2} + cos^2\frac{B}{2} - cos^2\frac{C}{2} = 2\cos\frac{A}{2}\cos\frac{B}{2}\sin\frac{C}{2}$.

OR

3 From the top of the hill 200 meters high, the angle of depression of the top and bottom of a pillar on the level ground are 30° and 60° respectively. Find the height of the pillar.

4 (a) If $u = tan^{-1}\left(\frac{x^3+y^3}{x-y}\right)$, then prove that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = \sin 2u$.

(b) Find the n[th] differential coefficient of $x^3 logx$.

OR

5 (a) If $y = tan^{-1}\left(\frac{\sqrt{1+x^2}+\sqrt{1-x^2}}{\sqrt{1+x^2}-\sqrt{1-x^2}}\right)$ for $0 < |x| < 1$, find $\frac{dy}{dx}$.

(b) Find the derivative of $log\left(x + \sqrt{x^2 - 1}\right)$.

6 (a) Evaluate $\int \frac{dx}{(x+2)(x+3)}$.

(b) Prove that $\int_0^{\pi/2} \frac{sin^n x}{sin^n x + cos^n x} dx = \frac{\pi}{4}$.

OR

7 (a) Evaluate $\int_0^{2a} x^{7/2}(2a - x)^{-1/2} dx$.

(b) Find the value of $\int_0^{\pi/2} log(tanx) dx$.

Contd. in page 2

8 (a) Solve the differential equation $\frac{dy}{dx} = \frac{y^2+1}{1+x^2}$.

(b) If $ax^2 + 2hxy + by^2 = 1$, prove that $\frac{d^2y}{dx^2} = \frac{h^2-ab}{(hx+by)^3}$.

OR

9 (a) Solve $y^1 + 2xy = e^{-x^2}$.

(b) Solve the differential equation $(1+x)y\,dx + (1+y)x\,dy = 0$.

10 (a) Find the area of the triangle formed by following straight lines and the coordinate axes:

(i) $2x - 4y - 7 = 0$.

(ii) $2x - 5y + 6 = 0$.

(b) Find the $L\{e^{-t}\, cosht + t^2\}$.

OR

11 (a) Find the locus of point P such that PA+PB = 6 where A(0, 2) and B(0, -2).

(b) Find the Laplace transform of $e^{-3t}(2\cos 5t - 3\sin 5t)$.

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Code: 17T00106A

Pharm.D I Year Regular & Supplementary Examinations July/August 2019

REMEDIAL MATHEMATICS

(For 2017 & 2018 admitted batches only)

Time: 3 hours | Max. Marks: 70

PART – A

(Compulsory Question)

*****

1 Answer the following: (10 X 02 = 20 Marks)

(a) Find the determinant of a matrix $A = \begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$.

(b) Show that $cos^2 48^\circ - sin^2 12^\circ = \frac{\sqrt{5+1}}{8}$.

(c) Find the derivative of the function $y = e^x + x^n + 5logx$.

(d) Find the value of $\lim_{x\to a}\left(\frac{xsina - asinx}{x-a}\right)$.

(e) Find the angle between the lines 2x + y + 4 = 0 and y-3x = 7.

(f) Evaluate $\int \sqrt{x}(1-x)dx$.

(g) Show that the points (2, 2), (6, 3), (4, 11) form a right angled triangle.

(h) Solve the differential equation $\frac{d^2y}{dx^2} - \frac{dy}{dx} = 0$.

(i) Find the Laplace transform of sin2t sin3t.

(j) Evaluate $\int cosec\, x\, dx$.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

2 (a) Show that $\begin{vmatrix} a & b & c \\ a-b & b-c & c-a \\ b+c & c+a & a+b \end{vmatrix} = a^3 + b^3 + c^3 - 3abc$.

(b) If A+B+C=180°, prove that $\sin\left(\frac{A}{2}\right) + \cos\left(\frac{B-C}{2}\right) = 2\cos\left(\frac{B}{2}\right)\cos\left(\frac{C}{2}\right)$

OR

3 (a) Show that $\begin{vmatrix} 1 & a^2 & a^3 \\ 1 & b^2 & b^3 \\ 1 & c^2 & c^3 \end{vmatrix} = (a-b)(b-c)(c-a)(ab+bc+ca)$.

(b) Find $\tan\left(\frac{\pi}{4} + A\right) and\ \cot\left(\frac{\pi}{4} + A\right)$ in terms of tan A and cot A.

4 (a) If $Y = x^4 \cos 3x$, find 1/n using Leibnitz's theorem.

(b) Find the differential equation from the equation $y = Ax^3 + Bx^2$.

OR

5 (a) Solve $\frac{dy}{dx} = \frac{x-y}{x+y}$.

(b) If $U = \log(x^3 + y^3 + z^3 - 3xyz)$, show that $\left(\frac{\partial}{\partial x} + \frac{\partial}{\partial y} + \frac{\partial}{\partial z}\right)^2 u = \frac{-9}{(x+y+z)^2}$.

6 (a) Evaluate $\int_a^b \sqrt{(x-a)(b-x)}dx$.

(b) Evaluate $\int \frac{1}{4+5\sin x}dx$.

OR

7 (a) Find the value of $\int_0^{\pi/4} \frac{e^{\tan x}}{cos^2 x}dx$

(b) Evaluate $\int x\, cos^2 x\, dx$.

Contd. in page 2

8 (a) Solve $(x+1)\frac{dy}{dx}+1=2e^{-y}$.

(b) Solve $xy'+y+4=0$

OR

9 (a) Obtain the differential equation of the coaxial circles of the system $x^2+y^2+2ax+c^2=0$ where 'c' is constant.

(b) Solve the D.E. $(xy^2+x)dx+(yx^2+y)dy=0$.

10 (a) Find the area of a triangle formed by the points (1, 2), (3, -4) and (-2, 0).

(b) Find the Laplace transform of $e^{-t}\cos 2t$.

OR

11 (a) Find the equation of locus of a point P, if A = (2, 3), B = (2, -3) and PA + AB = 8.

(b) Find $L\{e^{4t}\sin 2t\cos t\}$.

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Code: 17T00106A

Pharm.D I Year Regular Examinations July/August 2018

REMEDIAL MATHEMATICS

(For 2017 admitted batches only)

Time: 3 hours Max. Marks: 70

PART - A

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

(a) In the matrix $A = \begin{bmatrix} 1 & 0 & -1 & -2 \\ 3 & 2 & 1 & 0 \\ 5 & 4 & 3 & 2 \end{bmatrix}$. Write the order of the matrix and write the elements $a_{13}, a_{21}, a_{33}, a_{24}, a_{23}$.

(b) Evaluate $\begin{vmatrix} 3 & -1 \\ 0 & -5 \end{vmatrix}$.

(c) Find $\frac{dy}{dx}: x = y + 2$.

(d) Find $\frac{d^2y}{dx^2}: y = a^{mx}$.

(e) Find $\int x^2 \left(1 - \frac{1}{x^2}\right) dx$

(f) Find $\int (x^{2/3} + 1)\, dx$

(g) What are differential equations? Write one example.

(h) Find the order and degree of equation $\frac{d^2x}{dt^2} + w^2x = 0$

(i) Find the distance between the point (2,3), (1,5).

(j) Find Laplace transformation of $\sin hat$.

PART - B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT - I

2 Find x and y if $2x + 3y = \begin{bmatrix} 2 & 3 \\ 4 & 0 \end{bmatrix}$ & $3x + 2y = \begin{bmatrix} 2 & -2 \\ -1 & 5 \end{bmatrix}$.

OR

3 (a) If $x = a\cos\theta, y = b\sin\theta$, find the value of $\frac{x^2}{a^2} + \frac{y^2}{b^2}$.

(b) If $\tan\theta = \frac{5}{12}, find\ \sin\theta\cos\theta\cot\theta\ and\ cosec\,\theta$.

UNIT - II

4 (a) If $x = (\cos\theta + \theta\sin\theta), y = (\sin\theta - \theta\cos\theta)$, show that $\frac{dy}{dx} = \tan\theta$.

(b) If $y = (x^2)^{\log x}$ find dy/dx..

OR

5 (a) If $u = e^{4x+3y}\ find\ \frac{\partial u}{\partial x}, \frac{\partial u}{\partial y}$.

(b) If $f(x) = \sin 6x \,.\, \sin 3x\,, find\ f''(0)$.

UNIT - III

6 Find $\int \frac{1}{1+\tan x} dx$.

OR

7 Find $\int x\sin^{-1} x\, dx$.

UNIT - IV

8 Solve equation $\frac{dy}{dx} + xy = x$

OR

9 Solve using variable separable method $(1 - \cos y)dx + (1 - \cos x)dy = 0$.

UNIT - V

10 Find the equation of the straight line passing through the intersection of the lines x+y+1 = 0 and 2x-y+5 = 0 and through the point (5,-2).

OR

11 Find the Laplace transform of

(i) $\left(\sqrt{t} - \frac{1}{\sqrt{t}}\right)^3$. (ii) $\cos t \,.\, \cos 2t \,.\, \cos 3t$.

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Code: 14T00106A/ T0810006A

Pharm.D I Year Supplementary Examinations July/August 2018

REMEDIAL MATHEMATICS

(For 2016 and prior to 2016 admitted batches only)

Time: 3 hours Max Marks: 70

Answer any FIVE questions

All questions carry equal marks

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1 (a) Verify $(A+B)' = A' + B'$ for the matrices $A = \begin{bmatrix} -7 & -8 & 6 \\ 8 & 5 & 9 \\ 4 & 6 & 7 \end{bmatrix}$ and $B = \begin{bmatrix} 8 & 9 & 11 \\ 1 & 2 & 3 \\ 6 & 8 & 2 \end{bmatrix}$.

(b) Show that $\begin{bmatrix} -a^2 & ab & ac \\ ba & -b^2 & bc \\ ac & bc & -c^2 \end{bmatrix} = 4a^2b^2c^2$.

2 Prove that:

(a) $\frac{tan\theta + sec\theta - 1}{tan\theta - sec\theta + 1} = \frac{1 + sin\theta}{cos\theta}$.

(b) If $\theta + \phi = \frac{\pi}{4}, then\ (1 + \tan\theta)(1 + \tan\phi) = 2$

3 (a) An equilateral triangle has one vertex at (3,4) and another at (-2,3). Find the coordinates of the third vertex.

(b) Find the derivatives of the locus of a point which is equidistant from the point (2,4) and the y-axis.

4 (a) If $z = t^5 - 3t^4 + 2t^3 + 8, then\ find\ \frac{dz}{dt}$. Also, find the value of the derivative at t = 0,1,5.

(b) Find the derivatives of the following functions with respect to x at the indicated points.

$(i) x + \sin x \cos x\ \ at\ x = 0$ $(ii) \frac{1 - \sin x}{1 + \cos x}\ at\ x = \frac{\pi}{2}$.

5 (a) Form the partial differential equation by eliminating the arbitrary constants $z = ax^3 + by^3$.

(b) Form the partial differential equation by eliminating the arbitrary function $z = yf(x^2 + z^2)$.

6 (a) Evaluate the following definite integrals: $\int_1^2 \frac{5x^2}{x^2 + 4x + 3} dx$.

(b) Evaluate the following definite integrals: $\int_0^1 x(1 - x)^5 dx$.

7 (a) Solve the differential equation $e^{x-y} dx + e^{y-x} dy = 0$

(b) Solve $\frac{dy}{dx} + 2xy = e^{-x^2}$.

8 (a) Find the Laplace transform of $e^{2t} + 4t^3 - 2\sin 3t + 3\cos 3t$.

(b) Find $L\big(e^{-3t}(\cos 4t + 3\sin 4t)\big)$.

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Code: 14T00106A / T0810006A

Pharm.D I Year Regular & Supplementary Examinations July 2017

REMEDIAL MATHEMATICS

(For 2016 and prior to 2016 admitted batches only)

Time: 3 hours Max Marks: 70

Answer any FIVE questions

All questions carry equal marks

*****

1 (a) Find determination of $\begin{bmatrix} 2 & 4 & 3 \\ 1 & -4 & 1 \\ 0 & 3 & -7 \end{bmatrix}$.

(b) Given the matrices A, B, C, $A = \begin{bmatrix} 2 & 3 & -1 \\ 3 & 0 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 1 \\ 1 \\ 2 \end{bmatrix}$ $C = [1 \quad 2]$ then find (AB)C.

2 (a) Prove that $\frac{\sec 8A - 1}{\sec 4A - 1} = \frac{\tan 8A}{\tan 2A}$.

(b) Show that $4 \sin\frac{5\theta}{2} . 4 \sin\frac{3\theta}{2} . \cos 3\theta = \sin\theta - \sin 2\theta + \sin 4\theta + \sin 7\theta$

3 (a) Evaluate the limit:

$$\lim_{x \to 0} \frac{\sqrt{x^2+1} - \sqrt{-x^2+1}}{x}$$

(b) Find $\frac{dy}{dx}$ $when\, y = 5x^2 + \sin x + 4e^x - \log x + \tan x$.

4 (a) If the acute angle between the lines $4x - y + 7 = 0,\ Kx - 5y - 9 = 0$ is 45° then find the value of K.

(b) Find the derivative of the following function with respect to x, $e^x(x^5+3)$.

5 (a) Solve $\frac{dy}{dx} = (6x + y + 5)^2$.

(b) Solve $\frac{dy}{dx} + 2\frac{dy}{dx} = e^x$.

6 Find the Laplace transform of:

(a) $\frac{e^{at} - 1}{a}$.

(b) $(t+1)^3$.

(c) $e^{-4t}\, Sin\, 2t\, Cos\, t$.

7 (a) Find the equation of the line passing through the point $(3, -2)$ and perpendicular to the line $2x + 3y + 4 = 0$.

(b) Find the angles of the triangle whose sides are $x + y - 4 = 0,\ 2x + y - 6 = 0$ and $5x + 3y - 15 = 0$.

8 (a) If $A = \begin{bmatrix} 1 & -1 \\ -1 & 1 \end{bmatrix}$, show that $A^2 = 2A$ and $A^2 = 4A$.

(b) If $A = \begin{bmatrix} 4 & 1 & 0 \\ 1 & -2 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 0 & -1 \\ 3 & 1 & 4 \end{bmatrix}$, $C = \begin{bmatrix} 1 \\ 2 \\ 1 \end{bmatrix}$. Find the matrix X such that $(3B - 2A)C + 2X = 0$.

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Code: 17T00106A

Pharm.D I Year Regular & Supplementary Examinations November/December 2022

REMEDIAL MATHEMATICS

(For 2017, 2018, 2019, 2020 & 2021 admitted batches only)

Time: 3 hours | Max. Marks: 70

PART – A

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

(a) Find the determinant of matrix $A = \begin{bmatrix} 4 & 2 \\ 3 & 2 \end{bmatrix}$. 2M

(b) What is the use of Cramer's rule? 2M

(c) Find the equation of the circle whose centre is (5, 7) and radius 4. 2M

(d) Compute $\lim_{x\to 2} \frac{x}{x-1}$. 2M

(e) If tan(A-B) = 7/24 and tan A = 4/3, then find A+B. 2M

(f) Integrate $\int_0^{\pi/2} \cos^6 x\,dx$. 2M

(g) Define: (i) Differential equation. (ii) Order of a differential equation. 2M

(h) Solve: $\frac{dy}{dx} = \frac{x+y}{x}$. 2M

(i) Find Laplace transform of e^{-4t}. 2M

(j) Find the Laplace transform of t^2. 2M

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

2 (a) If $A = \begin{bmatrix} 1 & 2 \\ -1 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 1 \\ 1 & 1 \end{bmatrix}$. Find AB and BA. 5M

(b) Show that $\begin{vmatrix} 1 & a & a^2 \\ 1 & b & b^2 \\ 1 & c & c^2 \end{vmatrix} = (b-c)(c-a)(a-b)$. 5M

OR

3 (a) Find $\lim_{x\to 3} 4x^2 - 1$. 5M

(b) Prove that $\cot(A+15) - \tan(A-15) = \frac{4COS2A}{1+2\sin 2A}$. 5M

4 (a) Find the n^{th} derivative of $e^x (2x+3)^3$. 5M

(b) Find the n^{th} derivative of $e^{2x} \cos^2 x \sin x$. 5M

OR

5 (a) If $u = \tan^{-1}\left(\frac{x^3+y^3}{x+y}\right)$ prove that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = \sin 2u$. 5M

(b) If $x = r\cos\theta,\ y = r\sin\theta,\ z = z$ find $\frac{\partial(x,y,z)}{\partial(r,\theta,z)}$. 5M

Contd. in page 2

6	(a)	Find the value of $\int x^2 \cos x \, dx$.	5M
	(b)	Find the value of $\int_0^1 \sqrt{x(1-x)} \, dx$.	5M
		OR	
7	(a)	Evaluate $\int x^2 e^x \, dx$.	5M
	(b)	Evaluate $\int_0^{\frac{\pi}{2}} \frac{\sin x \, dx}{(\sin x + \cos x)}$.	5M
8	(a)	Solve $\frac{dy}{dx} = \frac{xy}{1+y}$.	5M
	(b)	Solve $y'' - 3y' + 2y = xe^{3x} + \sin 2x$.	5M
		OR	
9	(a)	Solve $\frac{d^2y}{dx^2} - 7\frac{dy}{dx} + 12y = 0$.	5M
	(b)	Solve $\frac{d^2y}{dx^2} - 5\frac{dy}{dx} + 6y = 4\sin 4x$.	5M
10	(a)	Find $L\{e^{-t}\sin 6t + t\cos 3t\}$.	5M
	(b)	Find the area of a triangle formed by the points (1, 2), (3, -4) and (-2, 0).	5M
		OR	
11	(a)	Find the Laplace transform of the function $Sin\ 5t\ Cos\ 2t$.	5M
	(b)	Find the Laplace transform of $t^2 e^{-3t} \sin 2t$.	5M

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Code: 17T00106B

Pharm.D I Year Regular & Supplementary Examinations July/August 2019

REMEDIAL BIOLOGY

(For 2017 & 2018 admitted batches only)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

(a) What is the need of classification?
(b) Give the outline of modern system of classification of kingdom plantae.
(c) Define inflorescence and what are main types of inflorescence.
(d) Write about the classification of fruits.
(e) Name the common plants family Lilliaceae and write the diagnostic features of flower.
(f) Describe the structure and functions of bacterial cell wall.
(g) Write a short note on mitochondria of animal cell.
(h) What are the functions of connective tissue?
(i) Write a short note on Pisces.
(j) What are poisonous animals?

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

2 Discuss about the leaf modifications with neat labeled diagrams.

OR

3 Explain in detail about the morphology of stem.

4 Describe the morphology of seeds with neat diagram.

OR

5 Discuss about the cymose inflorescence with help of neat diagrams.

6 Explain the taxonomic hierarchy of the family Umbelliferae.

OR

7 Explain the systemic hierarchy of two plants belongs to the family Rubiaceae.

8 Differentiate between plant cell & animal cell and describe the structure and functions of Golgi apparatus.

OR

9 Classify epithelial tissues and explain their structure & functions with the help of neat diagrams.

10 Explain the general characters of reptiles.

OR

11 Explain the important characters of Chelonia mydas.

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